

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claims 1 to 9. (Canceled).

10. (New) A method for determining a rotor position of a synchronous motor, comprising:

applying a plurality of current vectors to the synchronous motor in different directions;

determining an amount of the current vector necessary to attain a defined deflection of the rotor, deflection of the rotor resulting in a restoring torque proportional to the deflection, the rotor returning to an original position by the restoring torque after application of each current vector; and

calculating the rotor position from at least one angular position of the current vector, for which an amount of the current vector necessary to attain the desired deflection of the rotor is minimal.

11. (New) The method according to claim 10, further comprising measuring a deflection of the rotor by a position-measuring instrument.

12. (New) The method according to claim 10, wherein the defined deflection of the rotor is less than 0.01° for a rotary synchronous motor.

13. (New) The method according to claim 10, wherein the defined deflection of the rotor is less than 0.1mm for a linear synchronous motor.

14. (New) The method according to claim 10, wherein the current vectors are distributed uniformly over one electrical period.

15. (New) The method according to claim 14, wherein the current vectors are distributed in steps of less than 10° .

16. (New) The method according to claim 10, wherein the rotor position is calculated in the calculating step as half of a sum of two adjacent angular positions of the current vectors, for which the amount of the current vector necessary to attain the defined deflection of the rotor is minimal.

17. (New) The method according to claim 10, further comprising accounting for a direction of the defined deflection of the rotor to unequivocally determine the rotor position.

18. (New) The method according to claim 10, further comprising initially engaging a brake to hold the rotor of the synchronous motor.

19. (New) A control device for a synchronous motor, comprising:
an arrangement configured to apply a plurality of current vectors to the synchronous motor in different directions;
an arrangement configured to determine an amount of the current vector necessary to attain a defined deflection of the rotor, deflection of the rotor resulting in a restoring torque proportional to the deflection, the rotor configured to return to an original position by the restoring torque after application of each current vector;
and
an arrangement configured to calculate a rotor position from at least one angular position of the current vector, for which an amount of the current vector necessary to attain the desired deflection of the rotor is minimal.

20. (New) A control device for determining a rotor position of a synchronous motor, comprising:
means for applying a plurality of current vectors to the synchronous motor in different directions;
means for determining an amount of the current vector necessary to attain a defined deflection of the rotor, deflection of the rotor resulting in a restoring torque proportional to the deflection, the rotor returning to an original position by the restoring torque after application of each current vector; and

means for calculating the rotor position from at least one angular position of the current vector, for which an amount of the current vector necessary to attain the desired deflection of the rotor is minimal.